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Rechlin

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(54) **A.C. DRAIN LINE CLEANING NOZZLE**

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F24F 13/22 (2006.01)
B08B 9/032 (2006.01)
B08B 9/027 (2006.01)
E03C 1/308 (2006.01)
E03C 1/304 (2006.01)

(52) **U.S. Cl.**

CPC **F24F 13/222** (2013.01); **B08B 9/027** (2013.01); **B08B 9/0321** (2013.01); **B08B 2209/032** (2013.01); **E03C 1/304** (2013.01); **E03C 1/308** (2013.01); **F24F 2013/227** (2013.01); **F24F 2221/225** (2013.01)

(58) **Field of Classification Search**

CPC F24F 13/222; F24F 2013/27; F24F 2013/227; F24F 2221/225; B08B 9/0321; B08B 2209/032; B08B 9/027; E03C 1/308; E03C 1/304

See application file for complete search history.

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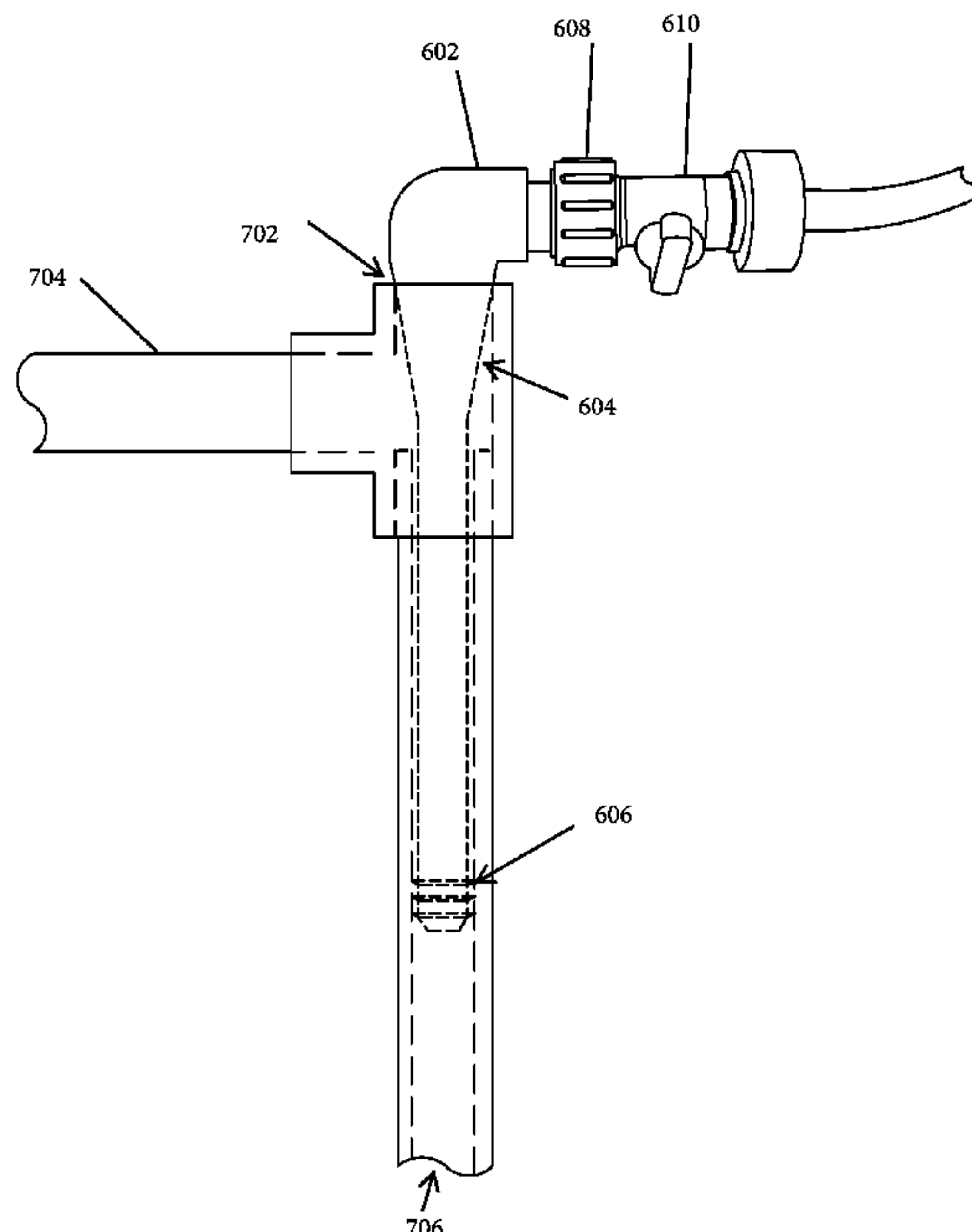
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(57) **ABSTRACT**

A drain line cleaning nozzle comprising a first end and a cylindrical portion connected to the first end is described. The cylindrical portion of the nozzle having a diameter that is configured to fit within a pipe. The drain line cleaning nozzle can also include a tapered portion connecting the cylindrical portion to a second end. The second end of the nozzle is configured to couple to a hose. The tapered portion is offset from the second end of the nozzle and is configured to fit within a plumbing connection and engage, via an interference fit, an opening of the plumbing connection connected to the pipe.

3 Claims, 9 Drawing Sheets



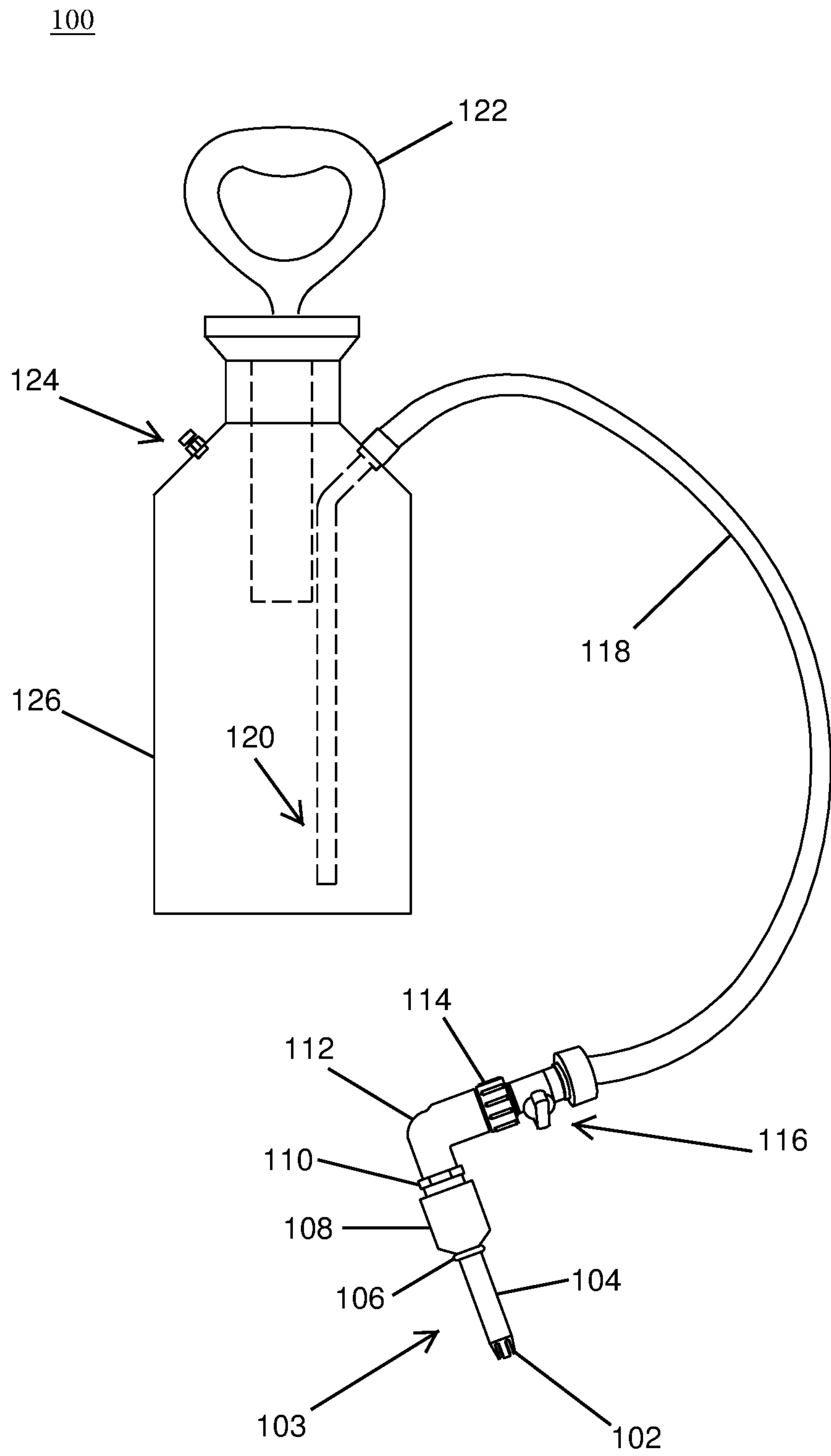


FIG. 1

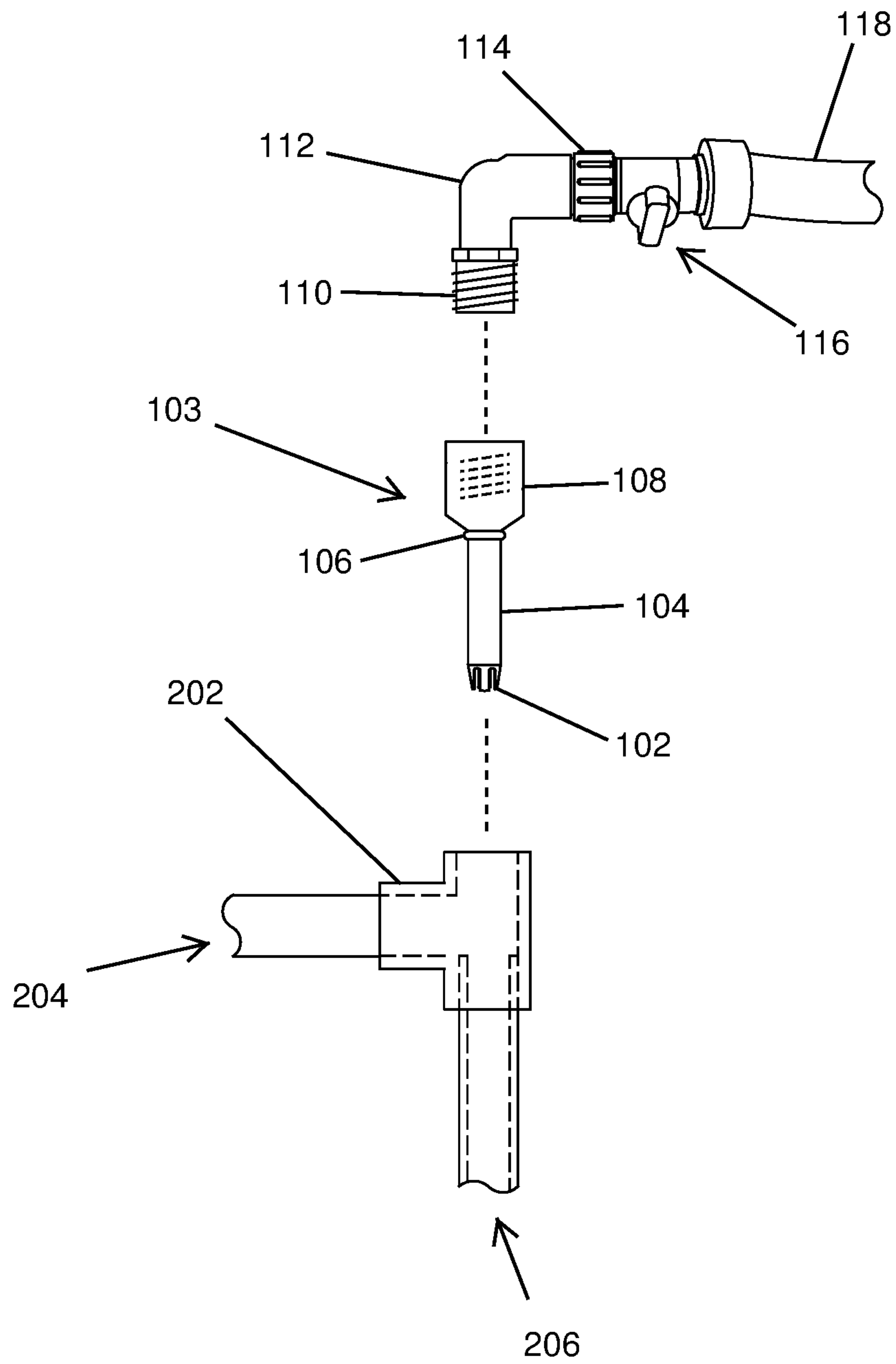


FIG. 2

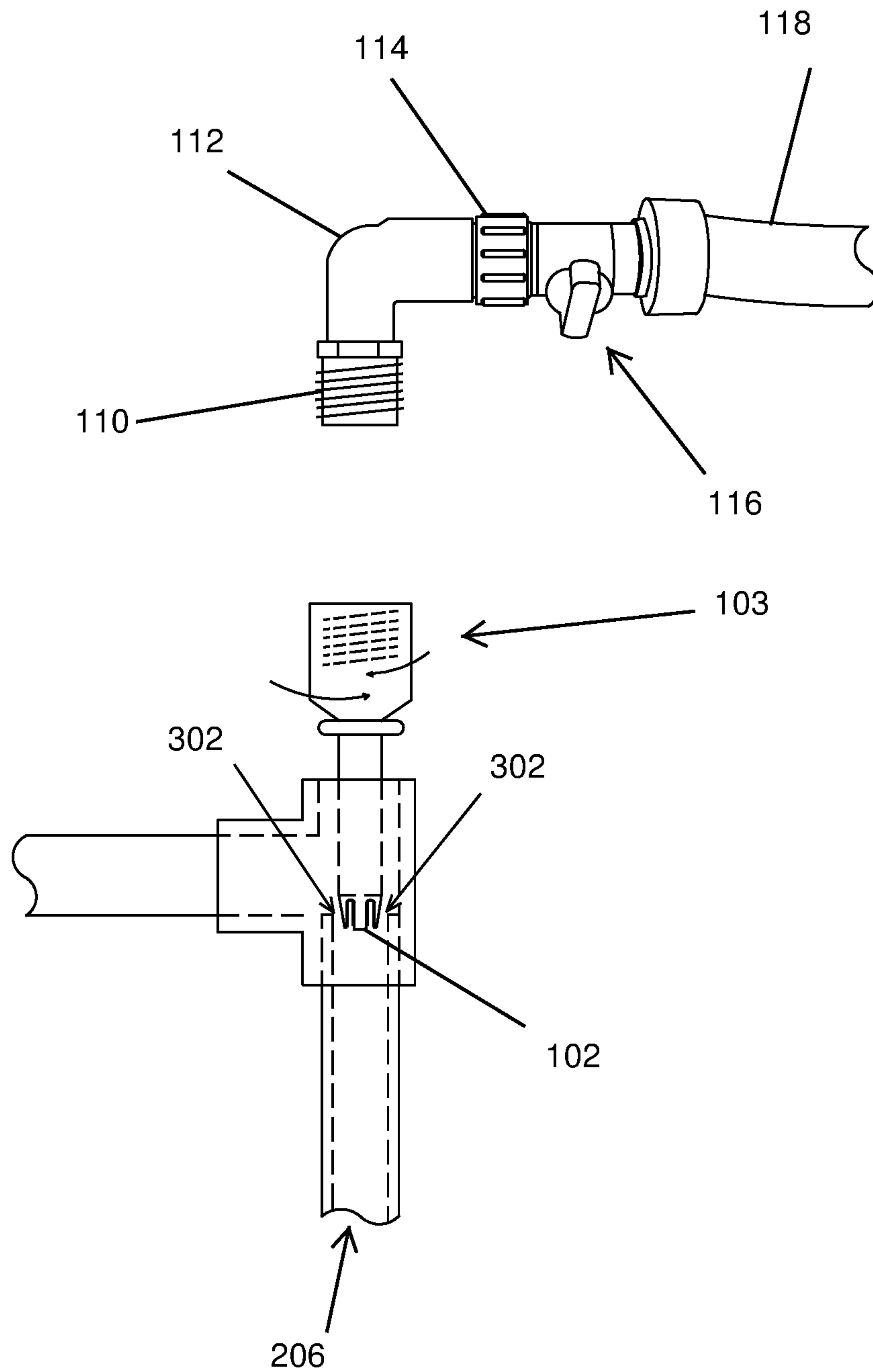


FIG. 3

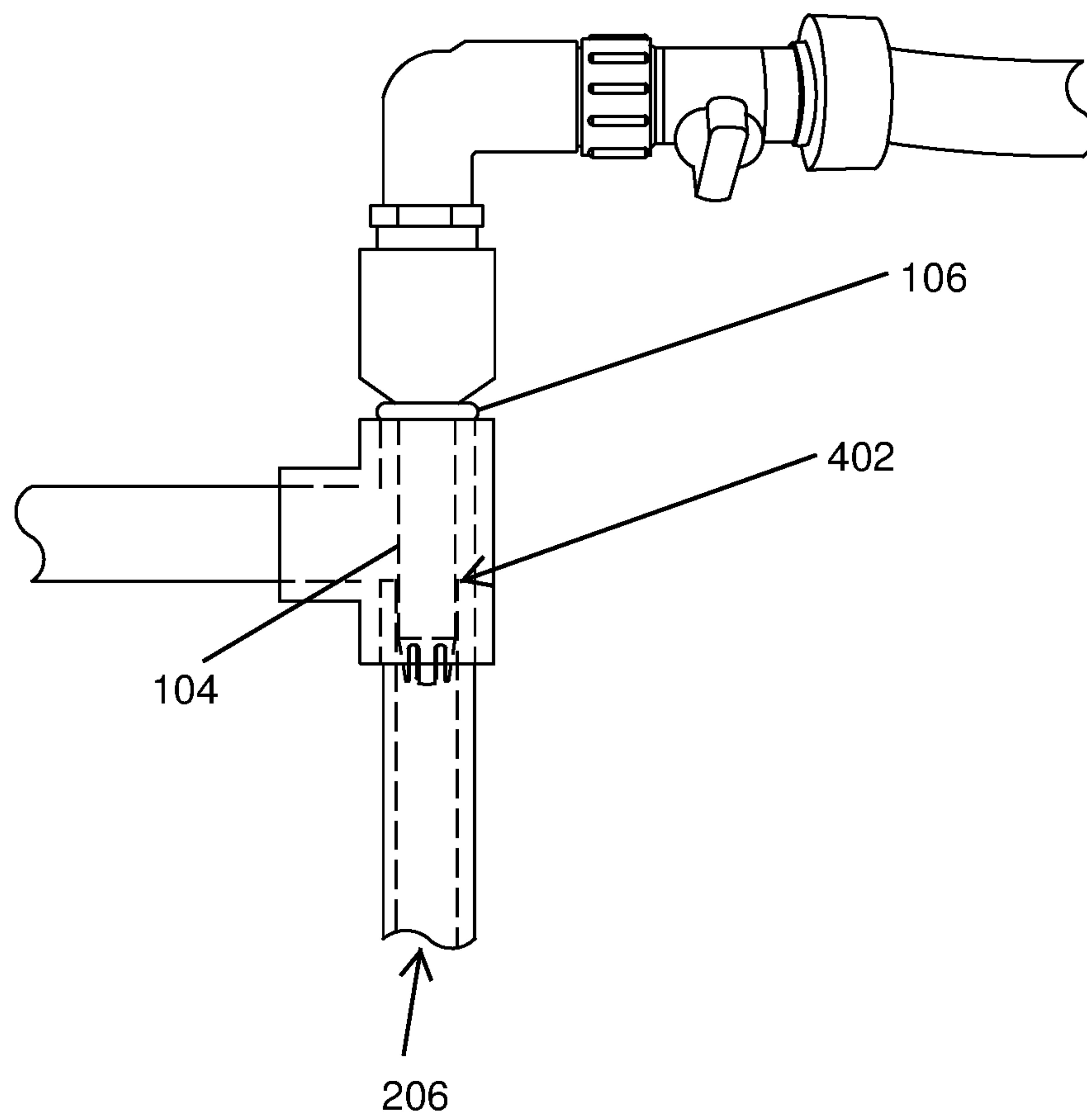


FIG. 4

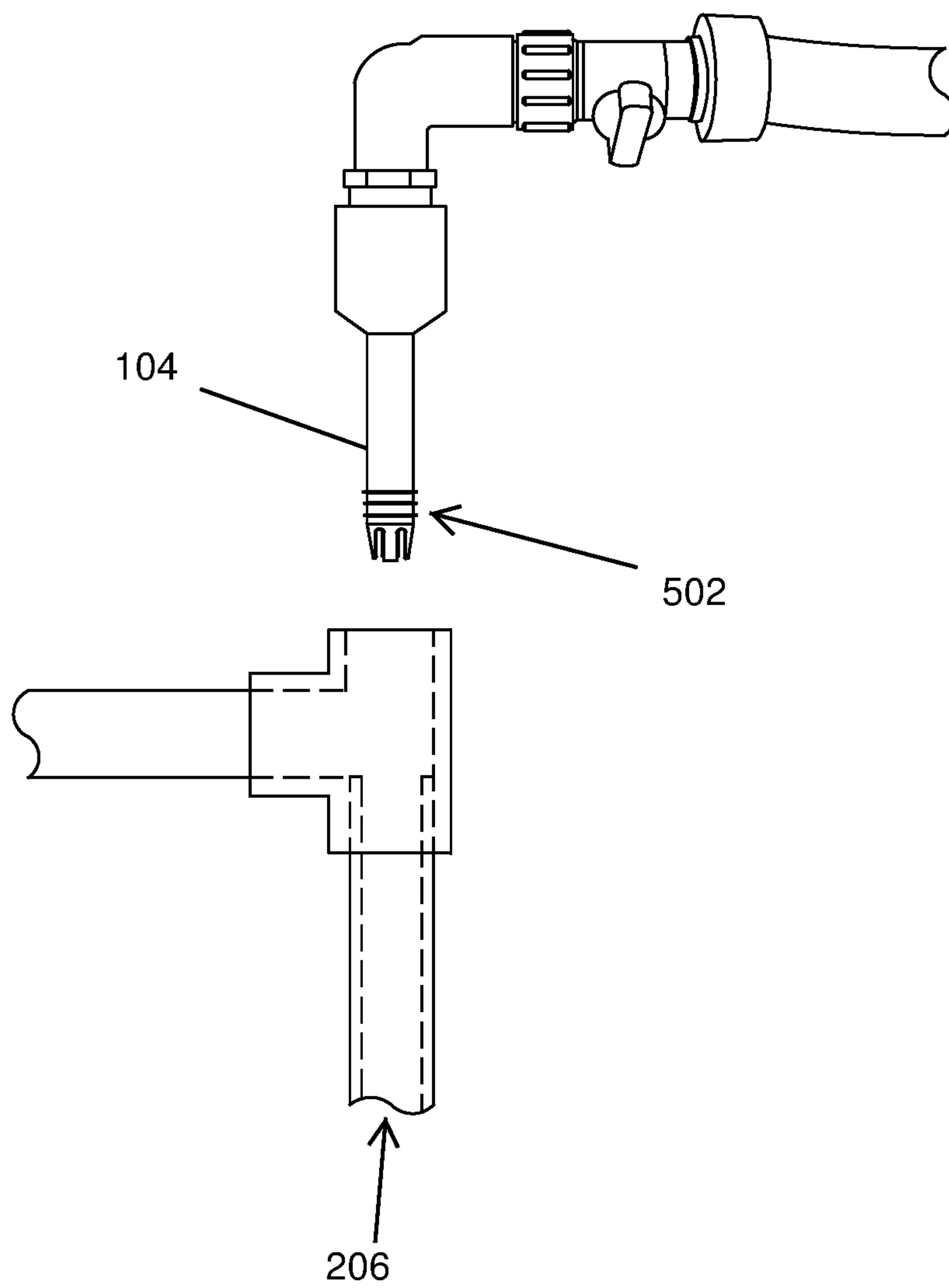


FIG. 5

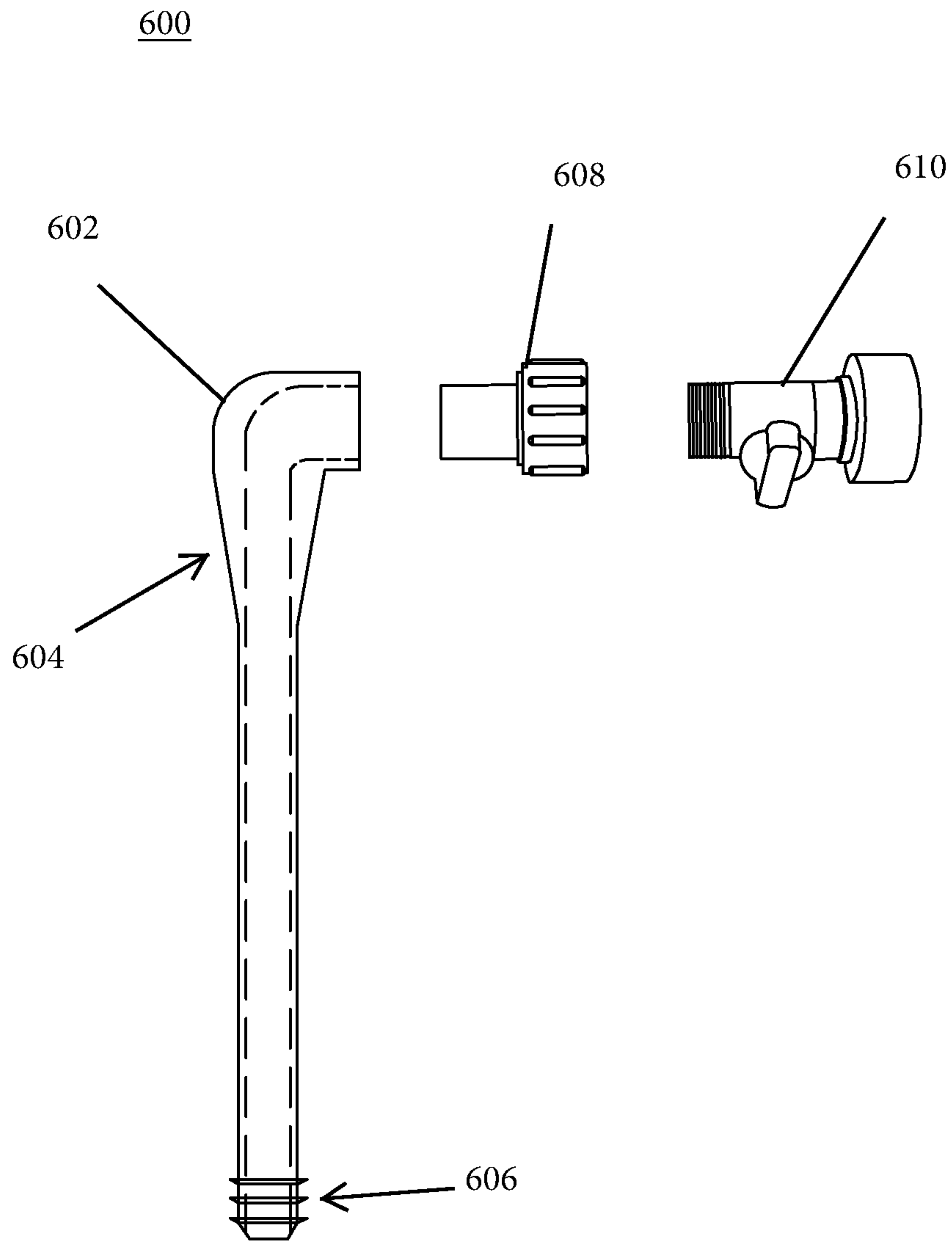


FIG. 6

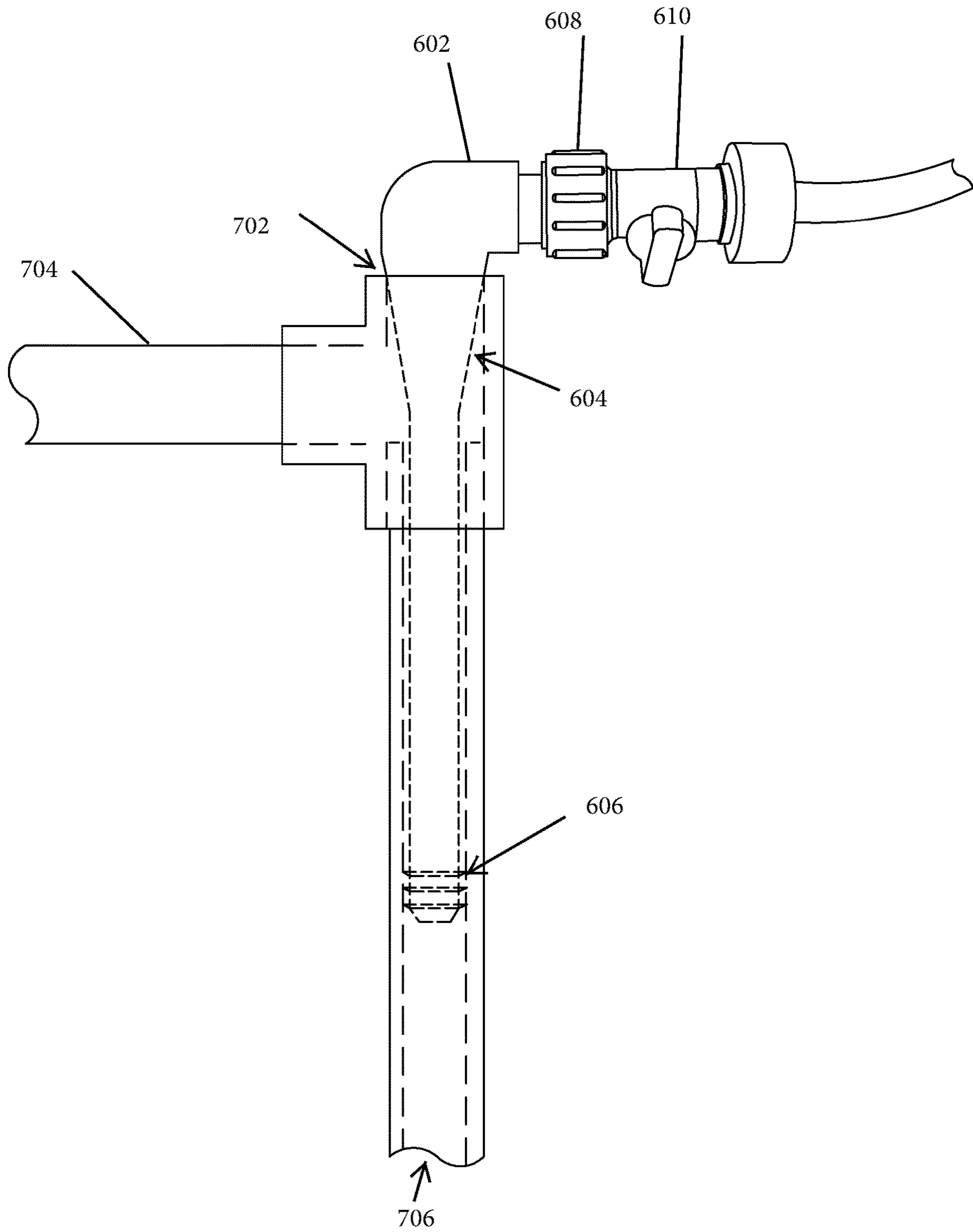


FIG. 7

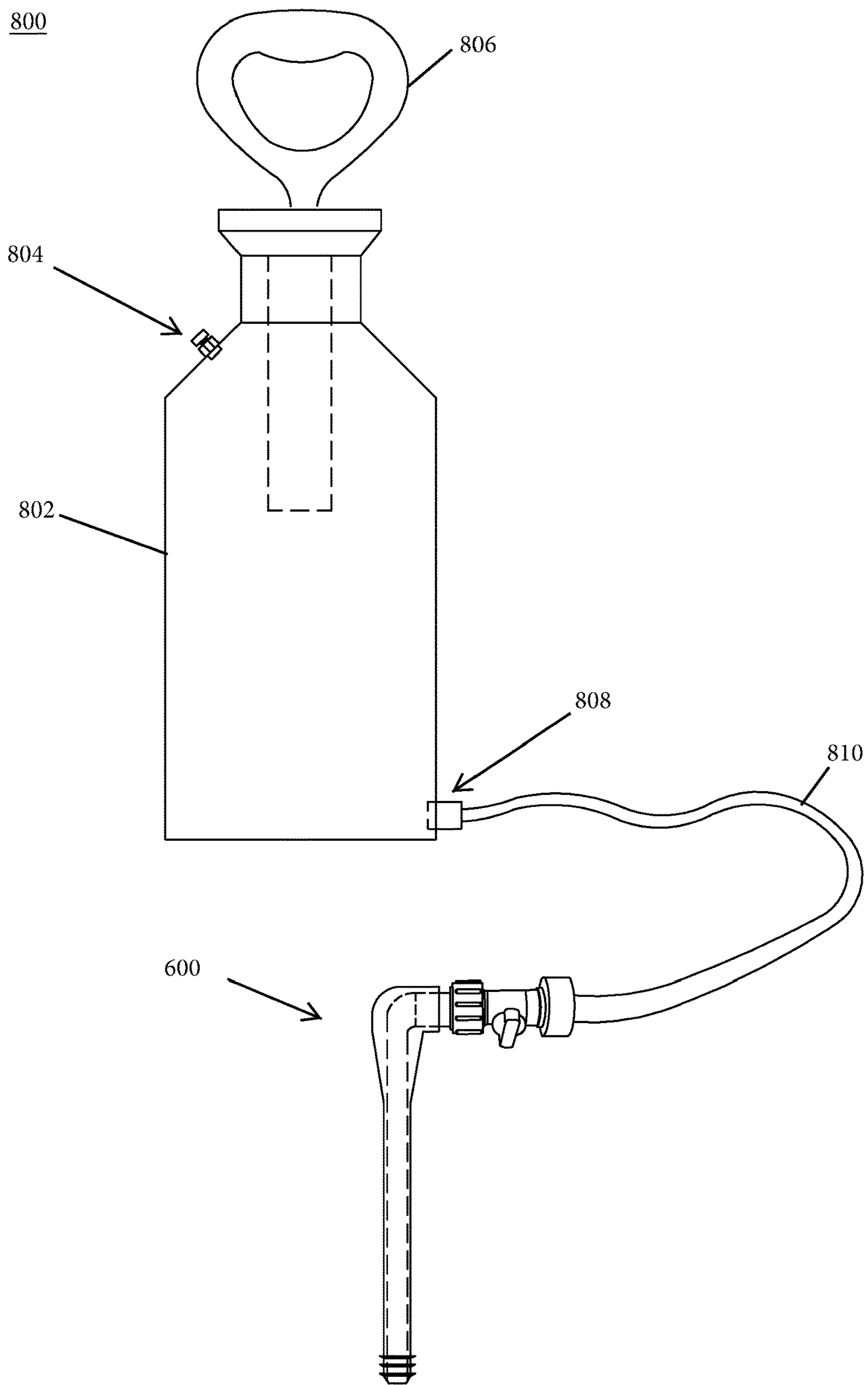


FIG. 8

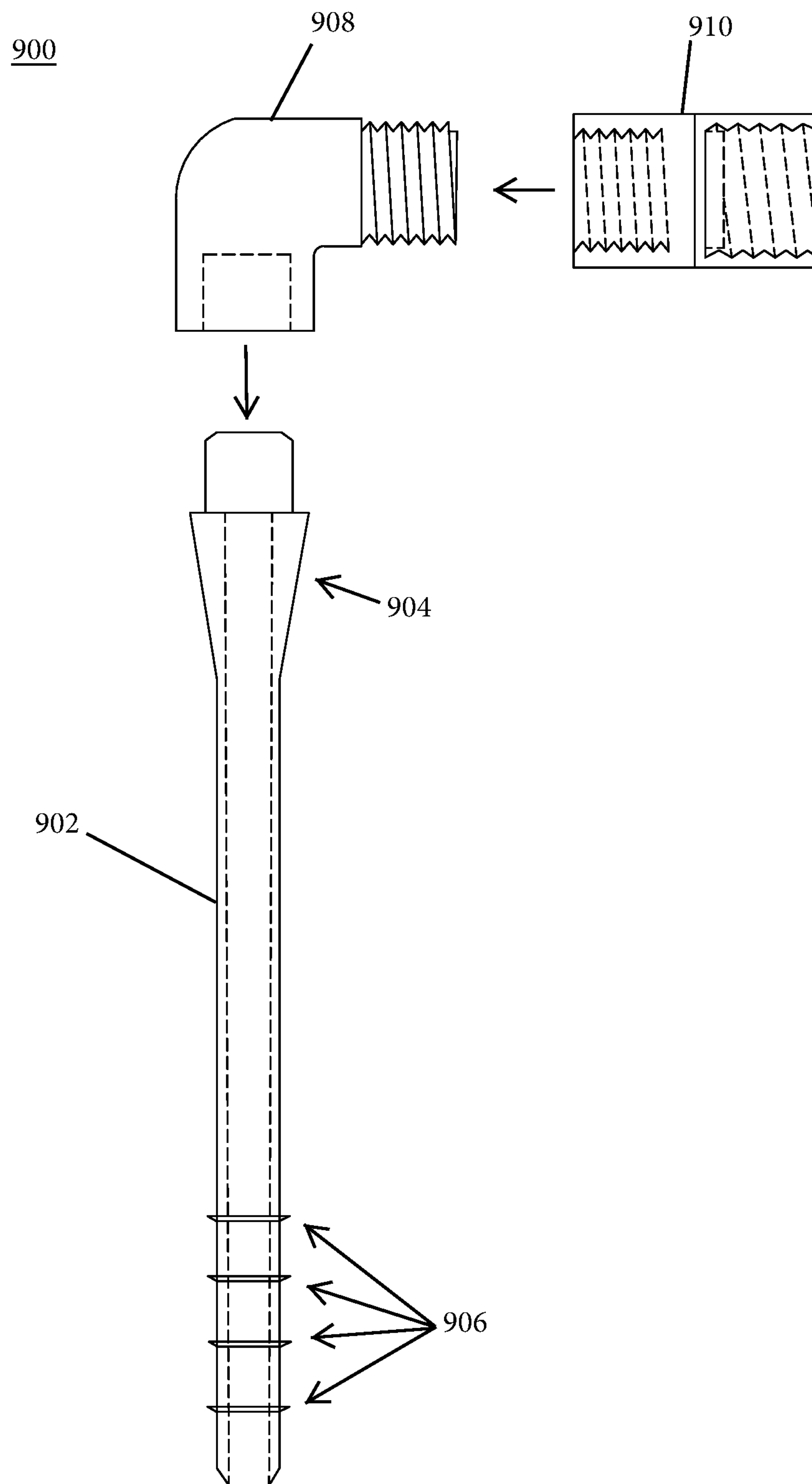


FIG. 9

A.C. DRAIN LINE CLEANING NOZZLE**CROSS REFERENCE TO RELATED APPLICATIONS**

This application is a continuation-in-part of application Ser. No. 16/224,726, filed on Dec. 18, 2018, which is a continuation-in-part of application Ser. No. 15/893,356, filed on Feb. 9, 2018, which issued as U.S. Pat. No. 10,799,921 on Oct. 13, 2020.

TECHNICAL FIELD

Embodiments relate generally to drain line cleaning devices and more particularly to a device and kit for cleaning air conditioner condensate drain lines.

BACKGROUND

Condensate drain lines can often be difficult to clean due to the location of air handlers (e.g., in an attic) and limited accessibility to the condensate drain line at or near the source of condensate (e.g., the air handler).

Embodiments were conceived in light of the above-mentioned problems and limitations, among other things.

SUMMARY

Some implementations can include a drain line cleaning nozzle comprising a first end and a cylindrical portion connected to the first end. The cylindrical portion of the nozzle having a diameter that is configured to fit within a pipe. The drain line cleaning nozzle can also include a tapered portion connecting the cylindrical portion to a second end. The second end of the nozzle is configured to couple to a hose. The tapered portion is offset from the second end of the nozzle and is configured to fit within a plumbing connection and engage, via an interference fit, an opening of the plumbing connection connected to the pipe.

The cylindrical portion of the nozzle can have a length of 9 ± 1 inches. The cylindrical portion can have an outer diameter of about 0.7 ± 0.2 inches and an inner diameter of 0.5 ± 0.1 inches. The second end of the nozzle is configured to couple to an intermediate member. The intermediate member is configured to couple to a valve that is configured to couple to a hose. The first end of the nozzle includes one or more flexible baffles configured to engage a sidewall of a drain line inserted into the plumbing connection.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 shows a side elevation view of a drain cleaning device in accordance with some implementations.

FIG. 2 shows an exploded view of an example condensate drain line cleaning device end section in accordance with some implementations.

FIG. 3 shows a side elevation view of an example drain cleaning device being inserted into a drain line in accordance with some implementations.

FIG. 4 shows a side elevation view of an example drain cleaning device inserted into a drain line in accordance with some implementations.

FIG. 5 shows a side elevation view of an example drain cleaning device with flexible baffles in accordance with some implementations.

FIG. 6 shows a side elevation view of an example drain cleaning device with flexible baffles in accordance with some implementations.

FIG. 7 shows a side elevation view of an example drain cleaning device with flexible baffles inserted into a drain line in accordance with some implementations.

FIG. 8 shows a side elevation view of a drain cleaning device in accordance with some implementations.

FIG. 9 shows a side elevation view of an example drain cleaning nozzle section with flexible baffles in accordance with some implementations.

DETAILED DESCRIPTION

FIG. 1 shows a side elevation view of a drain cleaning device **100** in accordance with some implementations. The drain line cleaning device **100** includes a removable lower section **103** that includes a tapered end **102** that includes apertures forming a serrated edge that can be used to remove excess glue within a drain line by rotating the tapered end **102** within a pipe. The removable lower section **103** also includes a lower portion **104** that is constructed to be inserted within an interior of a condensate drain line. The removable lower section **103** also includes an optional elastomeric gasket **106** to help seal the removable lower section **103** to a condensate drain line. The removable lower section **103** further includes a fluted opening **108** that is operable to connect to a corresponding element **110** on the drain line cleaning device **100** via a threaded connection (e.g., NPT) or operable to serve as a funnel for pouring a cleaning solution (e.g., bleach) into a condensate drain line.

The drain line cleaning device **100** include an angled connector **112** (e.g., a 90 degree connector), a threaded coupler **114**, a valve **116**, a hose **118**, an internal line **120**, a pump **122**, a pressure relief valve **124**, and a tank body **126**.

As shown in FIG. 2, the drain line cleaning device **100** is constructed to be inserted into a plumbing connector (e.g., tee **202**). In FIG. 2, the plumbing connector **202** connects a condensate line **204** coming from a source of condensate (or other fluid) such as an air handler to a drain line **206** that carries the condensate to a drainage area (e.g., outside of a building or into a sewage line, etc.).

The drain cleaning device **100** lower portion **104** is inserted (e.g., via an interference fit) into an opening of the drain line **206** via connector **202**.

In operation, air and fluid in the tank **126** is pressurized via the pump **122**. When the valve **116** is opened, fluid from the tank **126** flows under the urging of the pressure within the tank **126** out the interior line **120** and through the hose **118** to the lower portion **103** to supply fluid (e.g., water, air, or cleaning fluid such as a bleach solution) to help clean and clear the drain line **206** of buildup (e.g., mold, slime, etc.) or debris, while preventing the fluid from flowing back into condensate line **204**.

FIG. 2 shows an exploded view of a condensate drain line cleaning device **100** in accordance with some implementations. FIG. 2 shows the condensate line **204** from the equipment (e.g., air handler) connected to a fitting **202** (e.g., a tee) an on to the drain line **206**.

FIG. 3 shows a close up view of the lower portion **103** being twisted within the drain line **206** to cause the tapered end **102** to help remove excess adhesive **302** when the lower portion **103** is rotated within the drain line **206**.

FIG. 4 shows the lower portion **103** inserted into the drain line **206** such that the tapered end **104** engages the top of the drain line **402** in an interference fit and the elastomeric seal **106** engages the top of the fixture **202** to help provide a seal

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to prevent cleaning fluid from leaking from the drain line cleaning device when in use cleaning a drain line **206**.

In operation, fluid (e.g., water, cleaning solution such as a bleach solution, etc.) can be sprayed into the drain line **206** by the pressurized tank **126**.

FIG. **5** shows an example tapered end **104** having one or more flexible baffles **502** that are operable to engage the inside wall of a drain line (e.g., **206**) and help create a seal to prevent cleaning fluid from escaping around the tapered end **104**.

FIG. **6** shows an exploded view of a removable lower section **600** of a drain line cleaning device in accordance with some implementations. The removable lower section **600** includes an integrated angle **602** (e.g., a 90 degree), a tapered portion **604**, a plurality of flexible baffles **606**, a threaded coupler **608**, and a valve **610**.

The tapered portion **604** is constructed from a flexible material (e.g., neoprene rubber) to create a seal when inserted within an interior of a condensate drain line.

FIG. **7** shows a side elevation view of an example drain cleaning device with flexible baffles inserted into a drain line in accordance with some implementations. FIG. **7** shows an integrated angle **602** (e.g., a 90 degree), a tapered portion **604**, a plurality of flexible baffles **606**, a threaded coupler **608**, and a valve **610**, a top of the drain line **702**, a condensate line **704** from the equipment (e.g., air handler), a drain line **706**.

The lower portion **600** inserts into the drain line **706** such that the tapered portion **604** engages the top of the fixture **702** to help provide a seal to prevent cleaning fluid from leaking from the drain line cleaning device when in use cleaning a drain line **706**.

FIG. **8** shows a side elevation view of a drain cleaning device in accordance with some implementations. The drain line cleaning device **800** include a lower portion **600**, a tank body **802**, a pressure relief valve **804**, a pump **806**, an outlet **808**, and a hose **810**.

FIG. **9** shows a side elevation view of an example drain cleaning nozzle **900** with flexible baffles in accordance with some implementations. The drain cleaning nozzle **900** includes a cleaning nozzle **902**, a tapered portion **904**, a plurality of flexible baffles **906**, an angled connector **908** (e.g., a 90 degree), and a threaded coupler **910**.

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It is, therefore, apparent that there is provided in accordance with the presently disclosed subject matter, a drain line cleaning nozzle. While this disclosed subject matter has been described in conjunction with a number of embodiments, it is evident that many alternatives, modifications and variations would be or are apparent to those of ordinary skill in the applicable arts. Accordingly, applicant intends to embrace all such alternatives, modifications, equivalents and variations that are within the spirit and scope of the disclosed subject matter.

What is claimed is:

1. A drain line cleaning nozzle comprising:
a first end;

a cylindrical portion connected to the first end, wherein the cylindrical portion of the nozzle has a diameter that is configured to fit within a plumbing connection and includes one or more flexible baffles configured to engage a sidewall of a drain line inserted into the plumbing connection to provide a seal at a first area;

a tapered portion connected to the cylindrical portion, wherein the tapered portion is constructed from neoprene and is configured to extend past an opening of the plumbing connection and create a seal at a second area different than the first area when the tapered portion engages the opening of the plumbing connection via interference fit; and

a second end connected to the tapered portion, wherein the second end of the nozzle is configured to couple to a hose via an intermediate member;

wherein the tapered portion is offset from the second end of the nozzle and is configured to fit within a plumbing connection and engage, via an interference fit, an opening of the plumbing connection to provide the seal at the second area.

2. The drain line cleaning nozzle of claim 1, wherein the cylindrical portion of the nozzle having a length of 9 ± 1 inches, wherein the cylindrical portion having an outer diameter of about 0.7 ± 0.2 inches and an inner diameter of 0.5 ± 0.1 inches.

3. The drain line cleaning nozzle of claim 1, wherein the intermediate member is configured to couple to a valve, and wherein the valve is configured to couple to a hose.

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